

The Peoples Gas Light and Coke Company
Docket No. 16-0376
Response to the Illinois Attorney General's 4th Set of Data Requests
Date of Requests: August 26, 2016

Page 1 of 1

REQUEST NO. AG 4.01:

Please provide a copy of the Company's original distribution system integrity management program ("DIMP") plan in Microsoft Word or searchable PDF format with all charts and graphs in functioning Excel files, and separate pages with any revisions to the original plan.

RESPONSE:

Peoples Gas' original DIMP plan was generated on August 2, 2011. Since then, there have been four revisions to the plan in years 2012, 2013, 2014, and 2016. Each of these versions can be found in AG 4.01 Attach 01 through AG 4.01 Attach 05 respectively.

Person(s) Responsible:

Thomas Webb -- Manager, Compliance



Peoples Gas Light & Coke Company

Distribution Integrity Management Program Plan

Effective August 2, 2011

Revision January 31, 2016

Reviewed by:

A handwritten signature in black ink, appearing to read "Tom Webb".

Tom Webb
Compliance Manager

Date: 28 Jan 2016

Reviewed by:

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Torrence Hinton
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Date: 8 Feb 2016

Reviewed by:

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Saul Lopez
Director of Operations Support

Date: Feb 5, 2016

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The Peoples Gas Distribution Integrity Management Program

1.0 Introduction

Peoples Gas is part of the WEC Energy Group and is headquartered at 200 E. Randolph St., Chicago, IL 60601. Peoples Gas is a regulated natural gas utility and has been serving residential and business customers in the city of Chicago since 1850. Currently, Peoples Gas serves over 800,000 customers, has over 4000 miles of main, and over 500,000 services.

2.0 Purpose and Scope

This document is the Distribution Integrity Management Plan for Peoples Gas and is intended to meet the requirements of Federal Regulations 49 CFR Part 192, Subpart P Gas Distribution Pipeline Integrity Management Program (DIMP). All gas distribution facilities as defined in 49 CFR Part 192.3, including mains, service lines, service regulators, high pressure distribution systems, and low pressure distribution systems are subject to this program.

The purpose of the Distribution Integrity Management Program is to enhance safety by identifying, analyzing, ranking, tracking, and reducing gas distribution system risks. The objective of a DIMP is to manage the integrity of a gas distribution system. An essential part of a DIMP is risk evaluation of the distribution system. The approach taken by Peoples Gas for risk evaluation is to group facilities by common traits or problems, and then perform risk ranking. This process allows the grouping of facilities that experience similar threats to be risk-ranked together. Then, if necessary, attention is focused on developing and implementing measures that address the greatest risks.

3.0 Document Structure

This document is derived from the WEC Energy Group Base Distribution Integrity Management Plan and the DIMP User Guide from the Northeast Gas Association and Southern Gas Association (NGA/SGA). Elements of these documents were incorporated and modified as necessary to meet the needs of Peoples Gas.

This document also refers to and utilizes the output from the SHRIMP program from the American Public Gas Association Security and Integrity Foundation to comply with the requirements of DIMP.

Peoples Gas recognizes that distribution integrity management may be an iterative (or repeating) process. It is recognized that each time a cycle (e.g., gather knowledge, identify threats, rank risks, take action to reduce risk, measure performance) is completed, areas needing additional data, analysis, or actions may become apparent. Because of this iterative process, the initial grouping of facilities, identification of the applicable threats, risk analysis, and measures for risk mitigation, based on initial knowledge of the system may be revised.

The key elements of the Distribution Integrity Management Program are:

- Knowledge of Distribution System
- Identification of Threats
- Evaluate and Prioritize Risk
- Identify and Implement Measures to Address Risks
- Measure Performance, Monitor Results, and Evaluate Effectiveness
- Periodic Evaluation and Improvement
- Report Results

These elements are addressed in detail in their respective sections of this document.

4.0 Responsibility and Authority

The Compliance Manager has overall responsibility to assure that the DIMP Plan processes are implemented by the organization in accordance with this DIMP Plan and associated regulatory requirements.

The designated Engineer assigned to DIMP has the responsibility for day-to-day program oversight and responsibility to assure that the plan is implemented effectively and is fully integrated with the company's operating procedures.

The Operating and Maintenance (O&M) plan General section documents the operational structure of Peoples Gas and defines the responsibility of various company groups and sections involved in operation, inspection, storage, control, design, maintenance, training, compliance and distribution activities. The other sections (exhibits) of the O&M plan further document company policies and procedures needed to comply with the requirements of various governing entities.

Subject Matter Experts (SME's) are used as needed and provide expert knowledge of past and current company practices, procedures, systems, and threats to the Distribution Integrity system that might not otherwise be documented. SME's from Gas Operations, Engineering, and Technical Training were used to develop the Peoples Gas DIMP plan. SME's were chosen by System Integrity personnel based on their knowledge and experience in their respective field. Generally, SME's are current or retired management personnel and are usually Supervisors or Managers of their area or shop. SME's may also be personnel such as Engineers or Specialists with specialized knowledge of a particular system, area, threat, etc.

5.0 Definitions:

Definitions are provided for acronyms or words which may be referenced in this plan.

AMRP: Accelerated Main Replacement Program – 20 year plan to replace Cast and Ductile Iron mains that have a high frequency of maintenance or repairs.

APGA SIF: American Public Gas Association Security and Integrity Foundation – non-profit corporation that created the SHRIMP program.

Asset Manager (Previously FMDR): a WAM application that holds facility information and maintains the results of inspections and maintenance processes.

Distribution Integrity Management Program Files: Operator records, databases, and/or files that contain either material incorporated by reference in the Appendices of the IM Plan or outdated material that was once contained in the IM Plan Appendices but is being retained in order to comply with record keeping requirements.

Distribution Line: a pipeline other than a gathering or transmission line (reference §192.3)

EFV: Excess Flow Valve. An Excess Flow Valve is a safety device that is designed to shut off flow of natural gas automatically if the service line breaks.

Excavation damage: any impact that results in the need to repair or replace an underground facility due to a weakening, or the partial or complete destruction of the facility including, but not limited to, the protective coating, lateral support, cathodic protection, or the housing for the line device or facility (reference §192.1001)

FMDR: Facilities Management Data Repository – a WAM application that maintains the results of inspections and maintenance processes

GIS: Geographic Information System – allows users to visualize geographic data in ways that reveal patterns, relationships and trends

GPTC: Gas Piping Technology Committee

Hazardous Leak: a leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous (reference §192.1001). This may also be referred to as a Class 1 or Grade 1 leak.

HDPE: High Density Polyethylene

ICC: Illinois Commerce Commission - Illinois state regulatory agency

IM Rule: 49 CFR, Part 192, Subpart P

Integrity Management Plan (IM Plan): a written explanation of the mechanisms or procedures the operator will use to implement its integrity management program and to ensure compliance with subpart P of 49 CFR Part 192 (reference §192.1001)

Integrity Management Program (IM Program): an overall approach used by an operator to ensure the integrity of its gas distribution system (reference §192.1001)

IT: Information Technology

IWC: inches of water column – measure of pressure (approximately 6 IWC = 0.25 psi)

LKMS Database: Legacy leak database – superseded by WAM database in 1st quarter 2010

Main: a distribution line that serves as a common source of supply for more than one service line (reference §192.3)

Mechanical Fitting: a mechanical device used to connect sections of a pipe. The term “Mechanical fitting” applies only to: Stub Type fittings, Nut Follower Type fittings, Bolted Type fittings or other compression type fittings (reference §192.1001)

MDPE: Medium Density Polyethylene

O & M Plan: Operating and Maintenance Plan – The O&M plan consists of several exhibits (sections) that document operational procedures of Peoples Gas and is maintained electronically on PowerNet.

PGL: Peoples Gas Light, the company may also be referred to in various documents as Peoples Gas Light and Coke Company, Peoples Gas, Peoples Gas Delivery

PHMSA: The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration

Pipeline: all parts of those physical facilities through which gas moves in transportation, including pipe, valves, and other appurtenances attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies (reference §192.3)

PowerNet: Centralized web-based intranet used by Integrys companies for communication and informational purposes.

psig: pounds per square inch gauge

Region: geographic areas within a distribution system consisting of mains, services, and other appurtenances with similar characteristics and reasonably consistent risk.

Risk: a relative measure of the likelihood of a failure associated with a threat and the potential consequences of such a failure

Risk Model: the integration of facility data, operational data, SME input, and established algorithms to estimate the relative risk associated with a gas distribution system threat

Service Line: a distribution line that transports gas from a common source of supply to an individual customer, to two adjacent or adjoining residential or small commercial customers, or to multiple residential or small commercial customers served through a meter header or manifold. A service line ends at the outlet of the customer meter or at the connection to customer piping, whichever is further downstream, or at the connection to customer piping if there is no meter (reference §192.3)

SHRIMP: Simple, Handy, Risk-based Integrity Management Plan - an on-line tool that operators of gas distribution systems may use to create a written Distribution Integrity Management Plan.

SME: Subject Matter Expert. An SME is an individual who is judged by Peoples Gas to have specialized knowledge based on their expertise or training.

Sub-Threat: a threat type within one of the primary threat categories specified in §192.1007(b)

Ticket: a notification from the one-call notification center to the operator providing information of pending excavation activity for which the operator is to locate and mark its facilities

WAM: Work Asset Management - is a set of system applications that manages the lifecycle of assets (mains, services, and valves) and the activities performed to construct, maintain, and regulate them. In March 2010, Peoples Gas transitioned from legacy computer systems to the WAM system.

6.0 Knowledge of Distribution System

Code Requirement: *§192.1007 (a) An operator must demonstrate an understanding of its gas distribution system developed from reasonably available information.*

Information, such as the materials and type of construction, the operating conditions of the pipe or facility, and other relevant factors within the surroundings in which the system operates, is referred to as the “knowledge of the distribution system.”

General knowledge of the system will assist in identifying threats and establishing which facilities or groups of facilities*, if desired, should be subject to risk evaluation.

* Facilities may be individual components or units (e.g., a particular district regulating station, an entire low-pressure distribution system). Groups of facilities generally have common traits (e.g., physical similarities such as the same pipe material or a particular type of valve) or common problems (e.g., small diameter cast iron pipe experiencing cracking, regulators that will not hold set point).

Records of the distribution systems may exist in many forms (e.g., paper, electronically) and in the knowledge and experience of Operations, Maintenance, or Engineering personnel. Information from these sources may be evaluated to assist in developing each operating company’s DIMP. The source of each record used to develop knowledge of the distribution system will be identified.

Peoples Gas will use the best information available at the time to make decisions about what is in the existing system. In some cases, materials or characteristics of some of the components in the system may not be able to be determined. This may be due to lost records, computer system changes or other reasons

6.1 Sources Used to Assess Threats & Risks to Pipeline Integrity

Code Requirement: *§192.1007 (a) (1) Identify the characteristics of the pipelines design and operations and the environmental factors that are necessary to assess the applicable threats and risks to the gas distribution pipeline.*

Peoples Gas has numerous procedures written and implemented to comply with governing requirements and to document current operational practices. These procedures are documented in the Operating and Maintenance Plan located in PowerNet at PowerNet>Business Areas, Depts, and Subsidiaries>Gas Engineering>Gas Operating Procedures>PGL and are maintained electronically by Gas Engineering Standardization.

The O&M Plan consists of manuals, programs, plans, policies and procedures and contains a General section and fifteen exhibits that describe Distribution, Field Service, Gas Control, Safety Inspection, Quality Assurance/Quality Control, Training, Emergency Operating, Welding, Damage Prevention, Corrosion Control, Lockout/Tagout, Gas Operations, O&M Transmission Outside Chicago, O&M for Manlove Field and Leak Survey activities.

In addition, each company department or group may have its own procedures, guidelines, plans, flowcharts or directives that may exist in paper or electronic form. For example, the Engineering department is responsible for the design of the distribution system. Procedures may be found at the Engineering offices at Peoples Gas Headquarters and on the PowerNet.

In March 2010, Peoples Gas transitioned from legacy computer systems to the Work Asset Management (WAM) system. Data from various O&M activities is stored in the WAM application Asset Manager. The Asset Manager database is the official data repository for Peoples Gas. Reports generated from the WAM system were used to identify and evaluate threats to the distribution system.

In addition to WAM reports, the following sources may be used to assess threats and risks to pipeline integrity:

- PHMSA Annual Report information from PHMSA website
- Pipe specifications and component information, including diameter, grade or yield strength, and wall thickness for steel pipe; manufacturer and Standard Dimension Ratio (SDR) for plastic pipe; size, location, and type for valves and pressure regulators. See material specifications located here: T:\DEPTS\GE_Standardization\Departmental\Materials\Standards\Material Specifications.
- Construction specifics, such as year installed, joining method (e.g., type of coupling, welded, fusion) and installation method (e.g., open trench, plow, boring, directional drilling, casings, and cast iron on concrete blocks) found in WAM reports, Navigate, ESRI GIS and/or as-built construction drawings.
- Corrosion control systems, which may be composed of coating (e.g., coal tar, fusion bond epoxy, wax), cathodic protection (e.g., galvanic or impressed current), electrical isolation devices, year of installation (e.g., years without cathodic protection), stray current mitigation (e.g., diodes, bonds), and above-ground corrosion control practices. See corrosion control methods in O&M Plan Exhibit X Corrosion Control Policy.
- Active and retired company personnel may provide additional information about the system
- Results of inspections and surveys such as leak surveys, corrosion inspections, patrols and liquids removal (WAM reports, metrics)

- Other maintenance records such as repairs, corrosion control systems, equipment or component replacements, material failure reports and incident reports (WAM reports, paper records)
- Excavation activity such as damage records, number of locate requests received, proposed significant construction activities (PGL Facilities Damage Database, NaviGate, Engineering projects)
- Geologic conditions such as frost areas and known washout areas. See also the Broken Main Report, which details damage to mains and can be found at T:\DEPTS\GO_ExecOfficeOps\Shared\Gas_Operatons_Division
- Maximum Allowable Operating Pressure (MAOP) See pressure listing in O&M plan Exhibit XII Gas Operations Section Manual chapter 3 section 7 page 3.
- Legacy computer system leak records (LKMS) data found in T:\DEPTS\GO_System_Integrity\Departmental\System_Integrity\DIMP\PGL

See also Appendix A List of Sources and Record Retention Summary.

The following resources are used to demonstrate an understanding of the gas distribution system:

- NaviGate details various company facilities such as mains, services, valves and regulators (as appropriate - status, material, pressure, size, location, install year, length, tap location, shutoff location, manufacturer, # of turns, etc.)
- C-First details customer information and may include meter access locations, gas appliances in residence and work order history.
- ESRI GIS shows the geographical relationships of data.
- Subject Matter Experts fill gaps in documented data knowledge.
- The Monthly Metrics Spreadsheet and Compliance Focus Areas Report summarize monthly metrics
- The Work Asset Management (WAM) system documents and manages performed work and facilities.
- The SHRIMP program supplements this DIMP plan with various leak data, risk ranking of threats, documentation of additional actions to reduce risk and the associated performance measures to evaluate effectiveness of the actions taken. The SHRIMP program also documents the implementation plan for the additional actions to reduce risk and the associated performance measures.

6.2 Operational Structure

The operational structure of Peoples Gas is documented in the General Section of the Operating and Maintenance Plan and in organizational charts found on PowerNet.

The headquarters of People Gas contains Senior Management, Engineering, Customer Relations, Human Resources, Distribution Planning, Construction Planning, Compliance and various other personnel.

Operational personnel are located at various facilities (shops) around Chicago. The main shops are North District Shop located at 3955 N. Kilpatrick Ave, Central District Shop located at 1250 S. Kilbourn Ave and South District Shop located at 38 W. 64th St. Each shop has its own General Manager who is responsible for the overall operation of the shop and its own Supervisory, Distribution, and Field Service personnel who report to the Managers. The Gas Operations Division of Peoples Gas consists of approximately 850 union and 180 management personnel.

6.3 Gas Distribution System Overview

For an overview of how natural gas is received by Peoples Gas, see O&M Plan Exhibit XII Gas Operations Section Manual.

The majority of Peoples Gas customers are either low pressure (6-8 IWC, MAOP of 14 IWC) or medium pressure (18-22psi, MAOP of 25psi) service. See O&M Plan Exhibit XII, section 2 for an explanation of the operating pressures. Peoples Gas gas quality is monitored by the Technical Support Group per the O&M Plan Exhibit III Gas Control section B. See also the NGPL tariff section 26 (original sheet 476) for pipeline supplier gas quality specifications.

Peoples Gas is in the process of transitioning from older cast and ductile iron pipes to newer cathodically protected coated steel and medium density polyethylene (MDPE) plastic pipe. In a similar fashion, older service pipe materials such as bare steel, copper, and clear (CAB) plastic are being replaced with MDPE plastic. In addition to upgrading to more modern materials, city areas are in the process of being upgraded from low to medium pressure service, where feasible. The advantages of medium pressure include reduced pipe size, increased safety by moving meter sets from inside residences to outside and reduced number of inside safety inspections to be performed.

Peoples Gas operates in a large, mid-western urban environment. The operating conditions include residential and business districts, downtown ("Loop") areas, two airports, commercial and industrial sites, proximity to rail and mass-transit systems, and common areas shared with other utility facilities.

The environment in which Peoples Gas operates is typical of the upper mid-western United States. This includes hot, humid summers, sustained below freezing temperatures in the winter, flash floods, freeze-thaw cycles, snow accumulation, etc. Soil types in the Peoples Gas distribution system may be rock, sand, dirt, clay, or loam. See also O&M Plan Exhibit I Distribution Department Manual General Order 6.000 Excavation and Trenching Requirements section IX for soil types.

Gas main piping is divided into segments for identification purposes. These segments can range in length from one foot to one mile. Each segment is given its own unique identifier known as a Facility ID. In a similar fashion, service piping is given its own unique identifier also known as a Facility ID. Main segments are ranked taking into account breaks, cracks, visual observations,

coupon analysis and repairs. This ranking is used for replacement analysis. For a detailed explanation of the main ranking formula see the files located on the Compliance Group SharePoint Site at

http://teams.integrysgroup.com/Depts/GO_PGLNSG/comp/Compliance%20Group/DIMP/Main%20Ranking%20Index.

Steel mains are cathodically protected and electrically isolated into segments known as a corrosion family. Each corrosion family is given a unique corrosion control number. For more information on corrosion families and cathodic protection, see O&M Manual Exhibit X Corrosion Control Policy section V.

Examples of Construction Practices utilized by Peoples Gas are listed below (this is not meant to be an all-inclusive list):

- Direct burial
- Open Trenching
- Insertion
- Welding
- Heat & Electrofusion
- Horizontal Directional Drilling

6.4 Overview of Past Design, Operations and Maintenance

Code Requirement: *§192.1007 (a) (2) Consider the information gained from past design, operations, and maintenance.*

Information gained from past design, operations and maintenance activities will be considered when demonstrating knowledge of the system. Engineering and Operations personnel will use their knowledge, experience and information gained from past designs, operations and maintenance activities when modifying existing or designing new facilities. Subject Matter Experts with extensive experience in operations and maintenance were consulted where appropriate to gain information of unique risks posed by historical practices that are otherwise not well documented. The Main Ranking Index discussed in section 6.3 above is one way Peoples Gas considers information gained from past design and O&M activities.

An interview with Subject Matter Experts from the Engineering department revealed the following “lessons learned”:

- Facilities will be located out of the street whenever possible (“double decking” – mains on both sides of the street in the parkway) to reduce the risk of excavation damage from “long-side services”, and to provide easier access to tap locations and increase operator safety during locating and maintenance activities
- Future designs and installations will have an increased number of valves for better controlling the gas flow during normal and emergency situations

The Engineering department also uses the STONER computer application to assist in the design and development of new facilities including pipe sizing and valve placement. The STONER program allows engineers to evaluate “what if” scenarios to refine and improve the safety and integrity of the system to be installed.

The Engineering department has also done extensive analysis of the Peoples Gas system for the Accelerated Main Replacement Program (AMRP). The AMRP is a long term project to replace Cast and Ductile Iron mains (and associated service pipes) with modern materials such as steel and polyethylene (PE) plastic.

6.5 Type and Location of Records

Records of the distribution systems may exist in many forms (e.g., paper, electronically) and in the knowledge and experience of Operations, Maintenance, or Engineering personnel. The source of each record used to develop knowledge of the distribution system will be identified.

Data sources used by the Integrity Management plan, the type of records that exist, the record location and contact person responsible for maintaining the records are listed in Appendix A at the end of this document. Data sources may also be referenced in the SHRIMP program. These data sources identify design characteristics, operating conditions and operating environmental factors necessary to assess the threats and risks to the integrity of the pipeline.

6.6 Identification of Additional Information Needed

Code Requirement: §192.1007 (a) (3) *Identify additional information needed and provide a plan for gaining that information over time through normal activities conducted on the pipeline (for example, design, construction, operations or maintenance activities).*

Additional information needed to fill gaps due to missing, inaccurate or incomplete records may be identified by any employee. The need for additional information may be identified through internal or external data requests, comparison of data from different databases (e.g., ESRI GIS & Asset Manager), transition from legacy computer systems, acquisition of or merger with another company, other organizational changes (personnel, structural, etc.), periodic review of DIMP documentation, audit/review of company records, or new regulatory requirements. Once the information has been identified, the appropriate managers and supervisors are notified and a plan for gathering the information will be developed.

Additional information needed has been identified and documented in Appendix B and in PowerNet on the PGL/NSG Business Support site (PowerNet> Business Areas, Depts & Subsidiaries>PGL NSG Business Support). See the Charter and Project Overview links under the Project Information tab for background information and reason for the WAM Gap Project. This site documents various projects to improve the WAM system and includes the mission statement, personnel assigned to PGL NSG Business Support, and success metrics.

The means to collect and the timeline for collecting the additional information will vary depending on the nature and extent of the information needed. Work crews may be tasked to collect the required information through routine or special inspections, surveys, or other O&M activities. Cross-functional teams that include Engineering, Operations, IT, or other personnel with specialized database knowledge may be assembled to review, analyze and correct database errors or deficiencies. Field data may be collected electronically or on paper forms. Information gathered on paper forms is given to the appropriate personnel for review and input into an electronic database. The paper documents may be stored locally at the shop or at a centralized

location at company headquarters. Information collected electronically using WAM is available immediately for review and retained automatically in the Asset Manager database.

Knowledge of the gas distribution system will be refined and improved as needed. A record of planned and/or completed improvements (other than those plans for gaining additional information through normal activities) will be documented or included by reference. Such efforts may include new data management practices or information gathered through special efforts that are not part of normal activities.

6.6a General Process for Identifying, Collecting, Correcting and Communicating Missing/Inaccurate Information in WAM

Process for identifying missing/inaccurate information in WAM:

The Engineer responsible for DIMP or other designated person reviews WAM reports (e.g. Facility List – Valves) in Microsoft Excel record format and sorts columns for missing/inaccurate information (zero values, blanks, etc.) during the annual review.

Process for communicating missing/inaccurate information in WAM to the relevant manager:

The Engineer responsible for DIMP or other designated person notifies the Manager of the affected area directly via email or notifies the General Manager of Field Operations to contact the appropriate Manager and provides a detailed listing/report of the missing/inaccurate information.

Process for collecting missing/inaccurate information in WAM:

The appropriate Manager will develop a plan/strategy to collect the missing/inaccurate information as identified on the WAM reports. The plan/strategy may include modification of current field information forms, special field inspections by designated personnel, use of SMEs, use of company facilities/tools (i.e. NaviGate, WAM), routine inspections by designated personnel, creation of single purpose forms or tables. Data collection may be through paper forms or electronic means. The manager may designate a Supervisor, Engineer, Operations Specialist, or other personnel to implement the plan/strategy.

It is possible that no data collection is necessary in certain instances – the information may already be in the database, but Business Support personnel may be needed to correct data reporting errors or create the proper links to the information.

Process for correcting/adding missing or inaccurate information in WAM:

The collected data is sent to the appropriate Manager or designated person, who then forwards the information to the appropriate company department or group. In general, Business Support updates the system database for service facilities and the Engineering/GIS group updates the system database for main facilities. The Business Support group may also update system information to correct WAM reporting errors.

Process for communicating corrected WAM information to DIMP:

When the WAM system database is updated, the appropriate group notifies the Manager or designated person of the update, who then notifies the Compliance Manager or designated Engineer responsible for DIMP. The Engineer responsible for DIMP or other designated person will then perform a review to ensure that the data is no longer missing/inaccurate on the WAM reports.

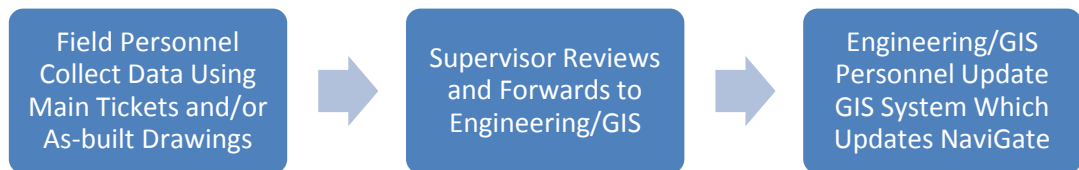
6.7 Data Capture for New Construction and Ongoing O&M

Code Requirement: §192.1007 (a) (5) Provide for the capture and retention of data on any new pipeline installed. The data must include, at a minimum, the location where the new pipeline is installed and the material of which it is constructed.

Relevant data on any new pipeline installed will be captured and retained for the life of the facility. The primary mechanism for capturing data on newly installed main pipeline is the field mark-up of an As-built construction drawing. As-built construction drawings are created by the Engineering department and given to distribution crews to document the actual facilities type, material, size, pressure, year installed, location and other pertinent information about the installation. The drawing is then given to the GIS group to enter the installed information into the GIS database.

Process Flow for Updating Databases

For Main Piping:



For Service Piping:

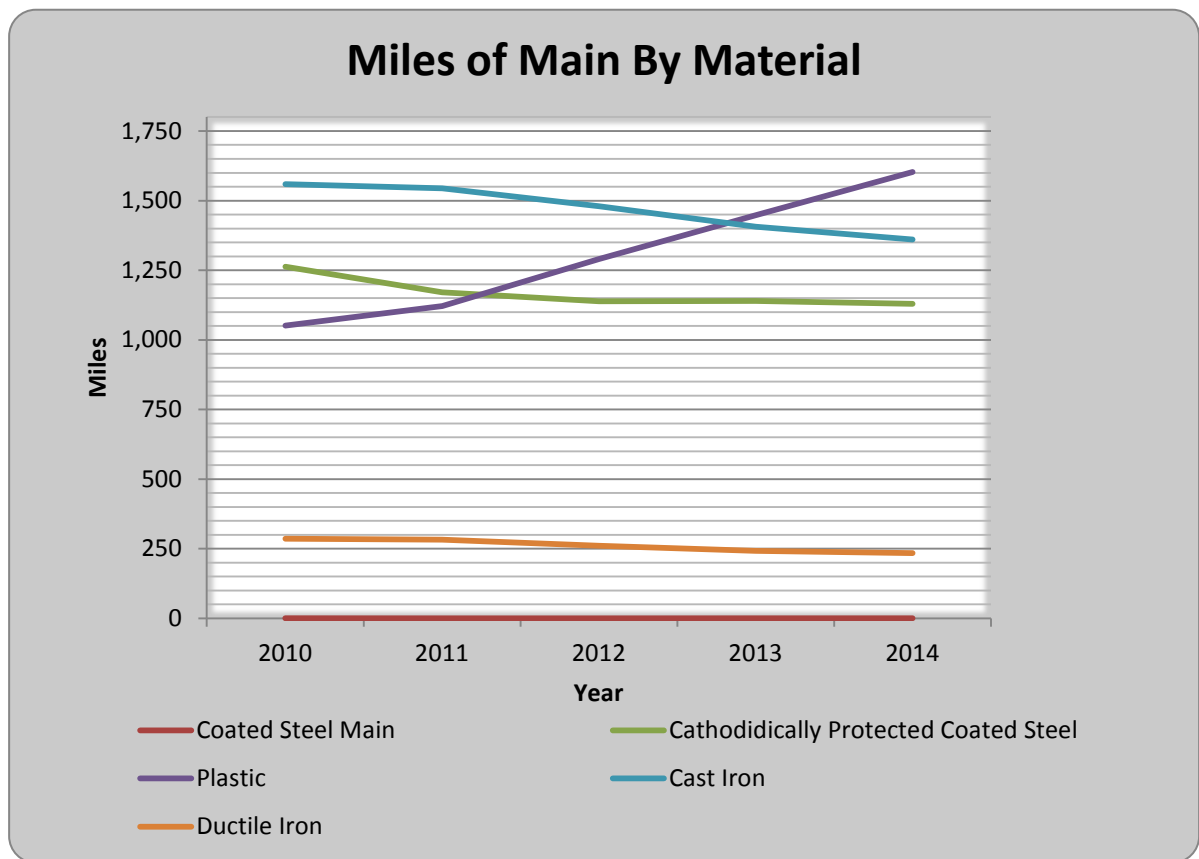


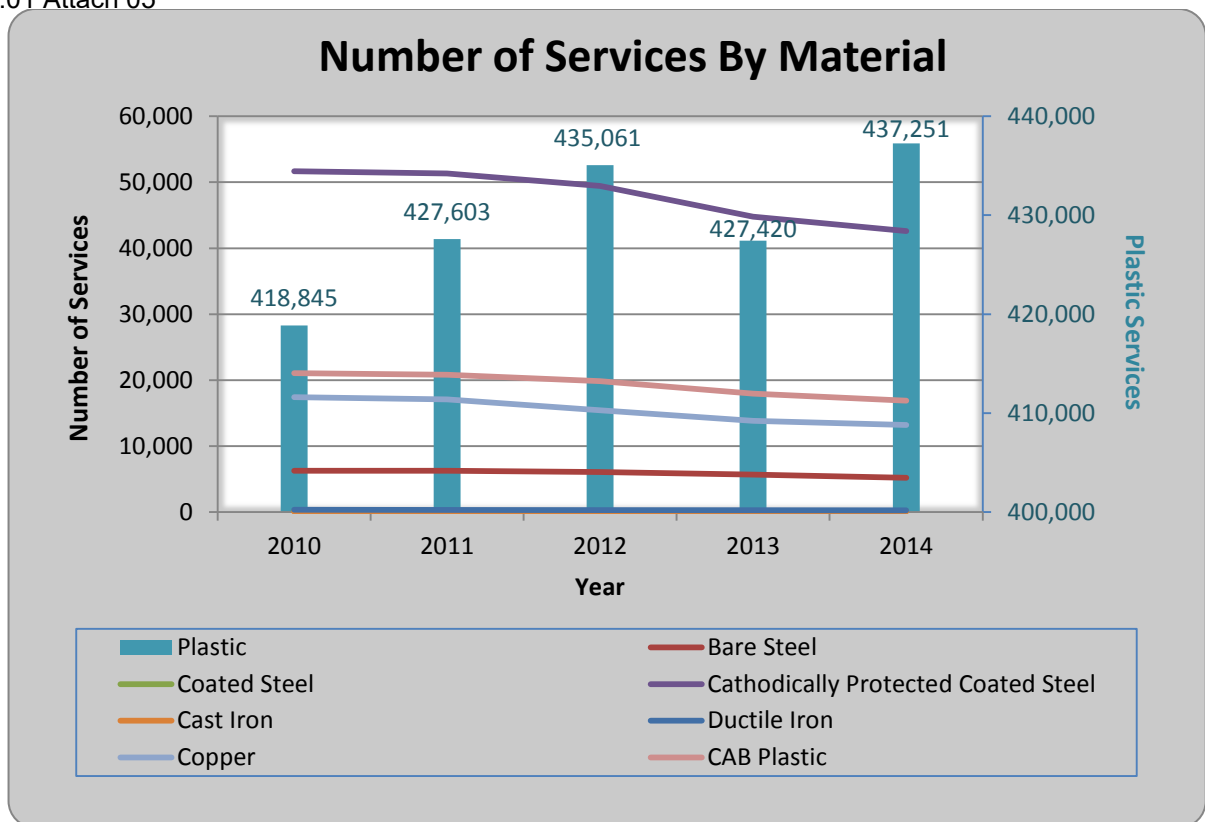
Information from ongoing operations and maintenance activities such as leak surveys, pipe inspections & maintenance, valve inspections & maintenance, corrosion inspections & remediation, etc., may be collected on paper by field personnel from Main Maintenance Tickets, Service Pipe Order tickets, Leak tickets, Material Failure Report forms, etc. or input electronically in the WAM database. Data that is not initially captured electronically by field personnel will be put into the WAM database by Supervisors, Engineers or other shop personnel.

6.8 Tables & Charts for Past Design and O&M

The tables and charts below document how Peoples Gas demonstrates knowledge gained from past design, operations and maintenance.

Material Types by Year (2010-2014)





System Operating Pressures

Summary of System Design by Operating Pressure as of 12-2014

Normal/Maximum Delivery Pressure	Miles of Main	Number of Services
Low-Pressure (6-8 IWC)/14 IWC	1,874.19	286,706
Medium Pressure (18-22 psig)/25 psig	2,431.34	228,881
High Pressure – greater than 25 psig	21.71	132

*Source: WAM Reports R43A, R43B

Summary of Operating Pressures – Medium Pressure

Material	MAOP
Cast Iron	25 psi
Ductile Iron	25 psi
MDPE	25 psi
HDPE	25 psi
Steel	25 psi
Copper	25 psi
Clear Plastic (CAB)	25 psi

*Source: PGL Engineering

Gas Main Summary by District as of 12/31/2014

	North District	Central District	South District	Total
# Active (Installed) Segments	32,470	26,603	28,930	88,003
Footage	8,512,124.5	6,735,965.75	7,599,763.00	22,847,853.25
Miles	1,612.14	1,275.75	1,439.35	4,327.24

*Source: WAM Report R43A

Service Pipe Summary by District as of 12/31/2014

	North District	Central District	South District	Total
# Active (Installed) Services	209,519	144,209	161,991	515,719
Footage	11,576,133	7,470,662	8,953,423	28,000,218
Miles	2,192.45	1,414.90	1,695.72	5,303.07

*Source: WAM Report R43B

Joining Method by Type (Mains)

Joining Method	System Count 2014
Bell & Spigot	8,991
Butt Fusion	23,031
Dresser Coupling	5,267
Mechanical Joint	13,499
Posi-Hold Coupling	2,071
Screwed Joint	294
Socket Fusion	46
Welded	32,208
Total	85,407

*Source: GIS Query

Summary of Various Facilities and System Count

Facility	System Count 2015
Outside Services with Exposed Piping (Risers)	253,876
Above Grade Regulators (HP-HP)	7
Below Grade Regulator Vaults (HP/MP)	17
Below Grade Regulator Vaults (MP/LP)	325
Security Valves (Slam Shut)	88
Remotely Operated Valves	42

*Source: WAM Reports

Summary of Valves

By Operating District		By Pressure	
Shop	System Count 2014	Pressure	System Count 2014
Central	5,284	Low	123
North	5,420	Medium	15,778
South	5,547	High	350

By Kind		By Type	
Valve Kind	System Count 2014	Valve Type	System Count 2014
Cast Iron	592	Ball	9,143
Ductile Iron	2	Butterfly	563
Plastic	9,084	Gate	5,743
Steel	6,334	Plug	502
Other	239	Other	300
Total	16,251		

*Source: WAM Report R43E Facility List

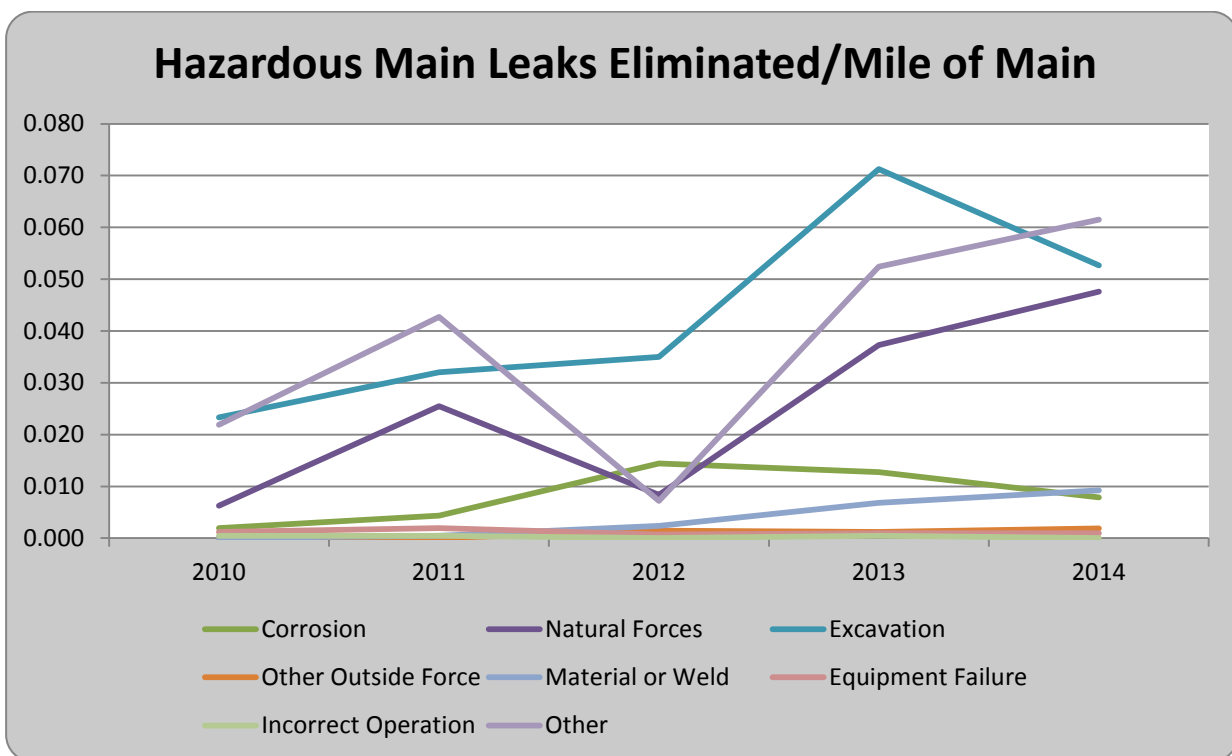
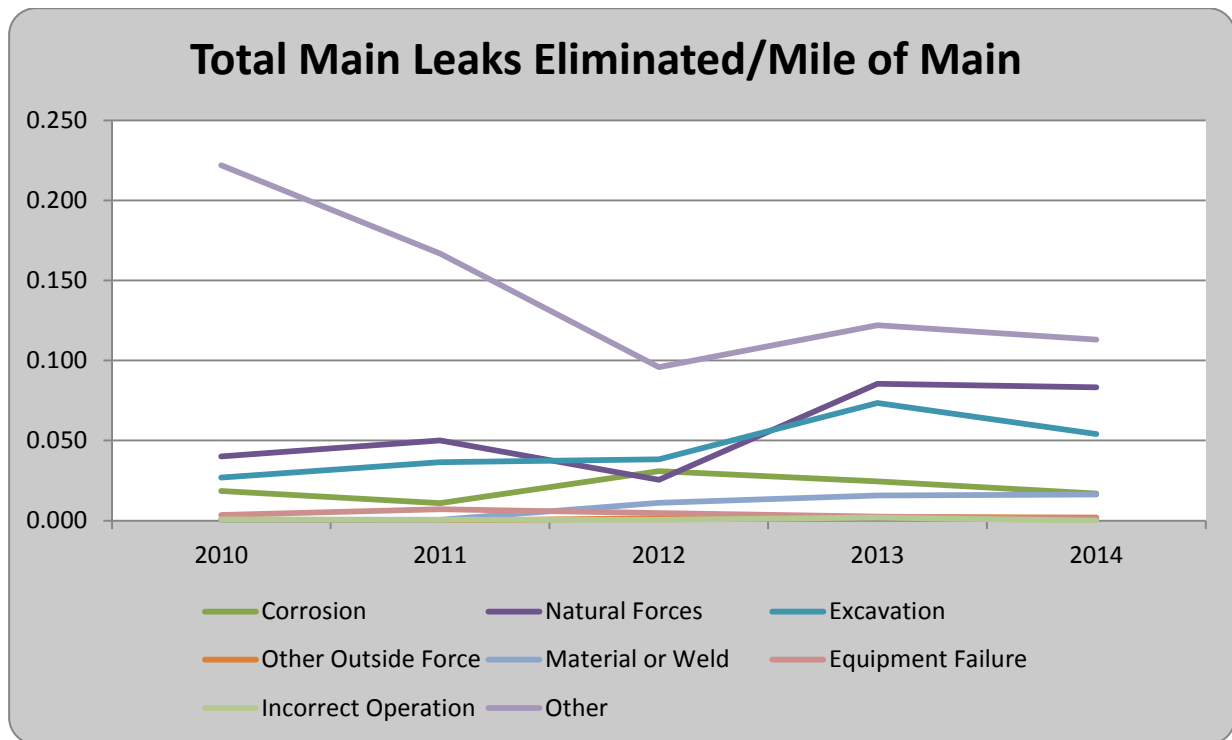
6.9 Details for Characteristics of Design, Operations and Environmental Factors

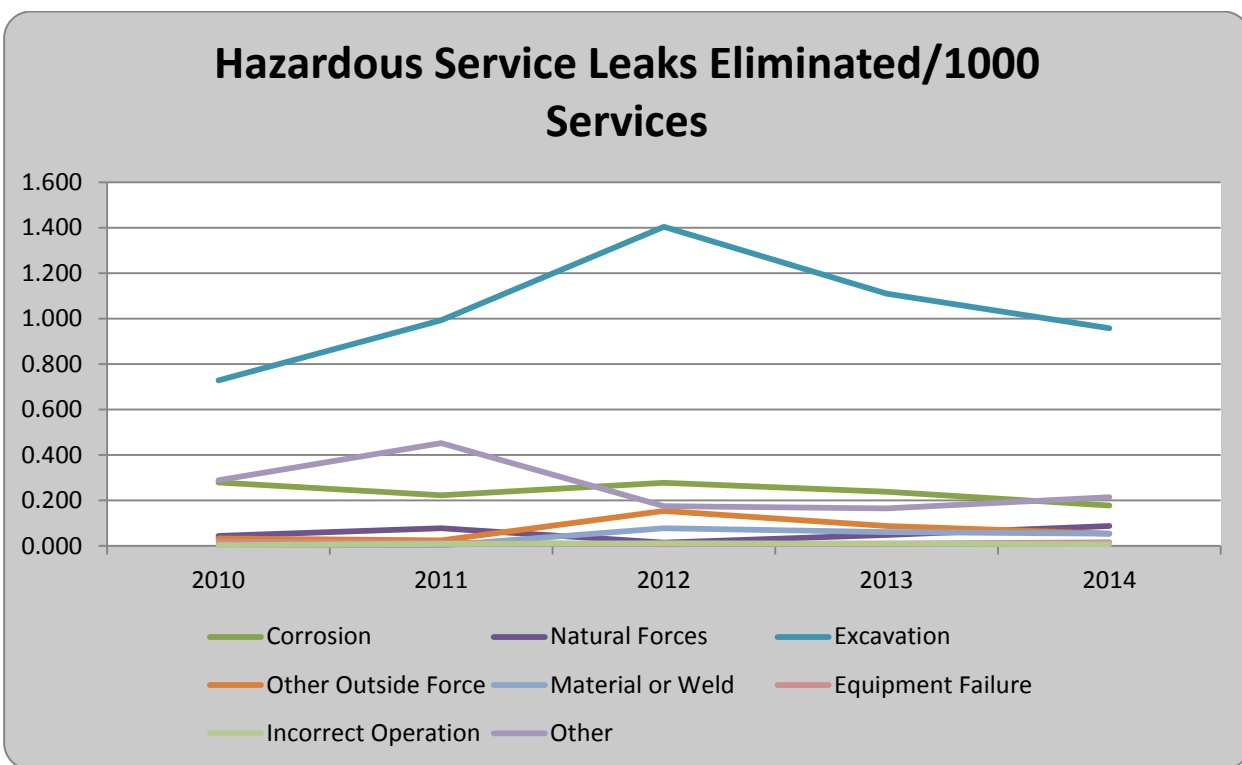
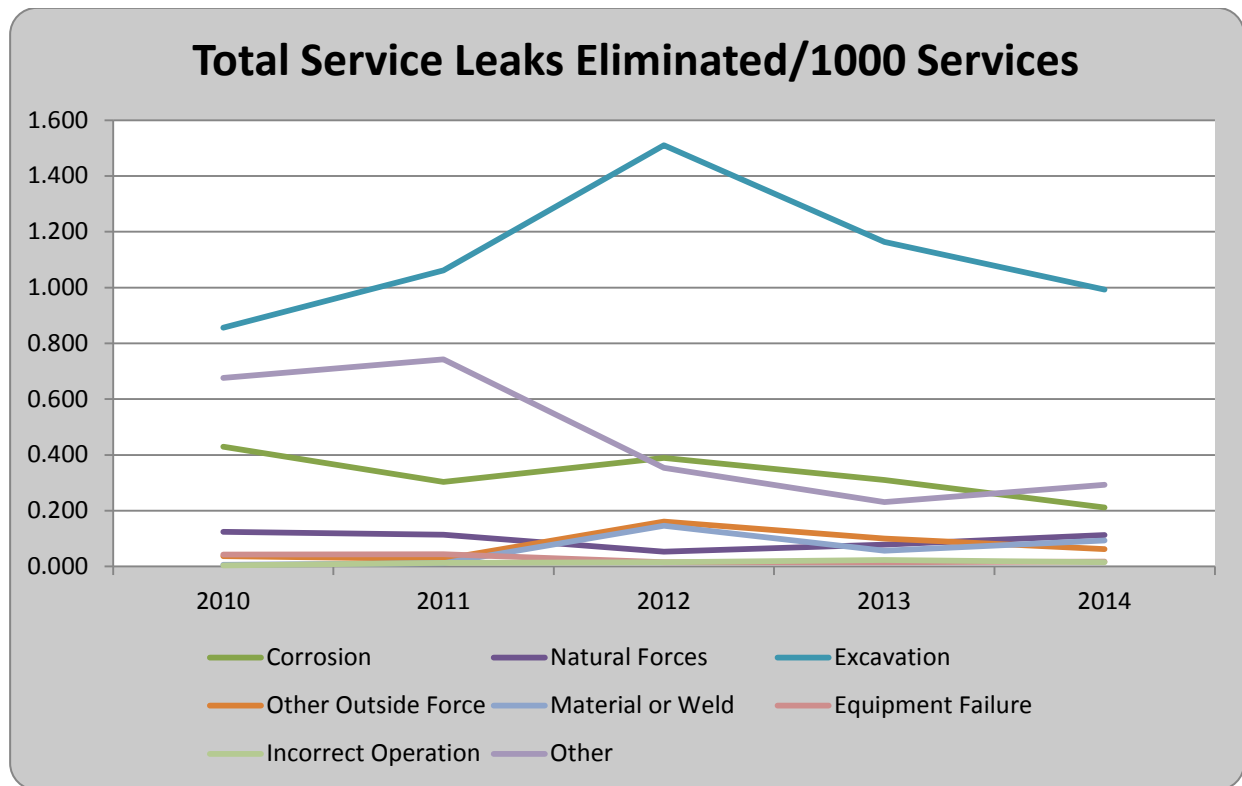
The following information documents the characteristics of the pipeline's design, operating conditions and environmental factors that are necessary to assess the applicable threats and risks (See Appendix C for PHMSA reports):

- Miles of Mains and Number of Services by Material Type (See Part B1 of PHMSA Form F 7100.1-1 incorporated by reference)
- Miles of Mains and Number of Service lines by material and nominal diameter (See Part B2 & B3 of PHMSA Form F 7100.1-1 incorporated by reference)
- Miles of Mains and Number of Services by material and decade (See Part B4 of PHMSA Form F 7100.1-1 incorporated by reference)
- The following are examples of information required by §192.1007(g):
 - §192.1007 (e)(1)(i) Number of hazardous leaks either eliminated or repaired, per §192.703(c), categorized by cause – See Part C of PHMSA Form F 7100.1-1 (2010 and later (incorporated by reference))
 - §192.1007 (e)(1)(ii & iii) Number of Excavation Damages and Number of Excavation Tickets by year – See Part D of PHMSA Form F 7100.1-1 (2010 and later (incorporated by reference))
 - §192.1007 (e)(1)(iv) Total number of leaks either eliminated or repaired, categorized by cause – See Part C of PHMSA Form F 7100.1-1 (2010 and later (incorporated by reference))
 - §192.1007 (e)(1)(v) Number of hazardous leaks either eliminated or repaired, per §192.703(c), categorized by material - See Appendix H – Mandatory Metrics and Performance Measures
 - Number of Excess Flow Valves Installed - See Part E of PHMSA Form F 7100.1-1 (2010 and later (incorporated by reference))

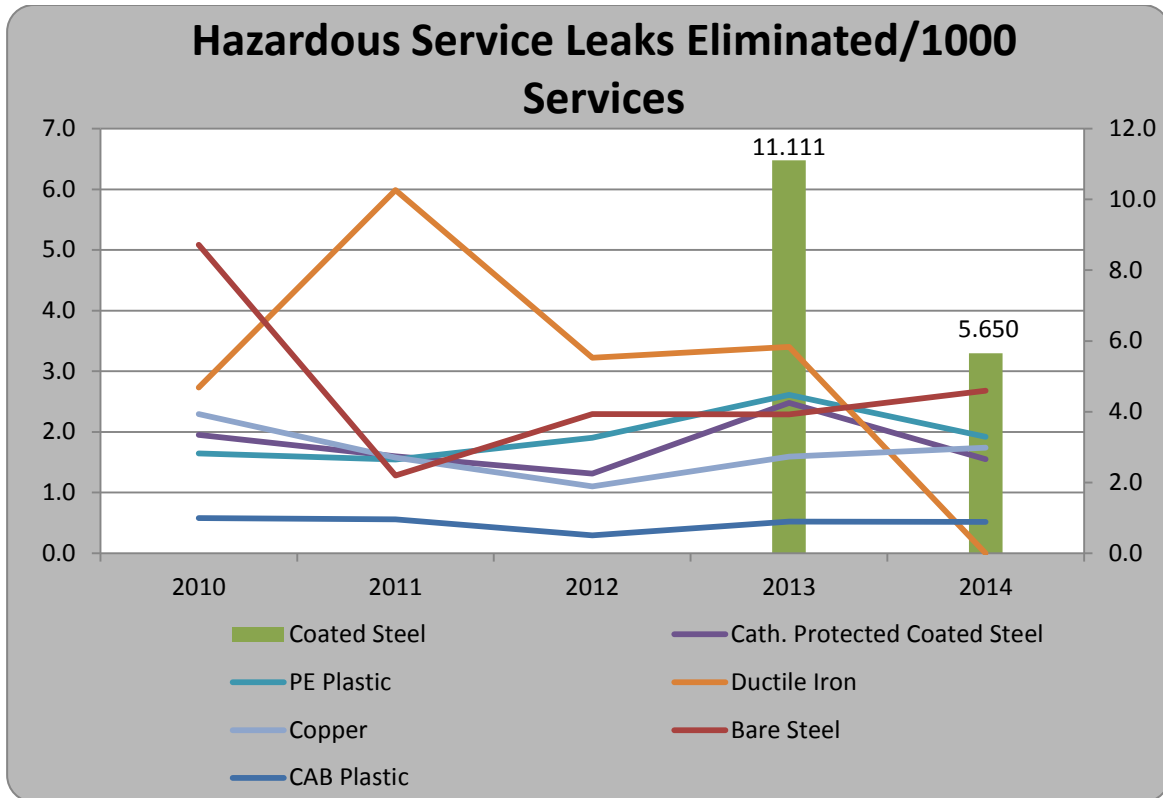
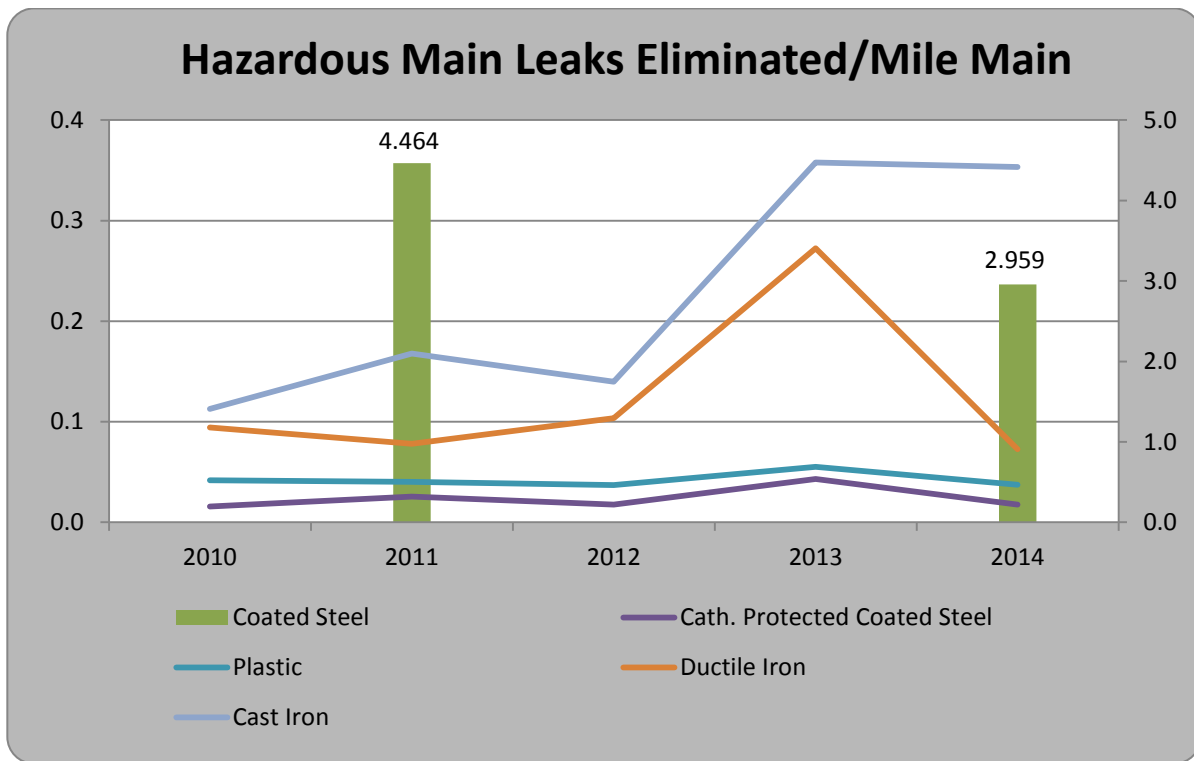
Other information that documents the characteristics of the pipeline's design, operating conditions and environmental factors that are necessary to assess the applicable threats and risks:

Eliminated Leaks by Threat Type

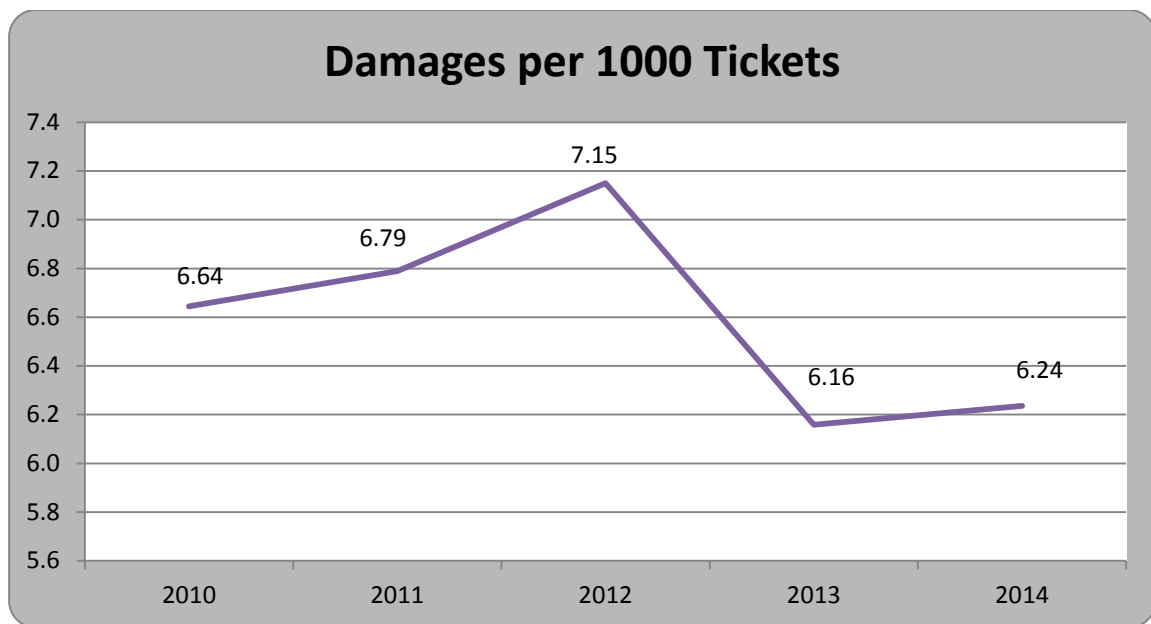




Eliminated Leaks by Material Type



Excavation Damages



Reportable Gas Incidents Summary by Year

Year	Miles of Main	Number of Incidents	Fatalities	Injuries	Property Damage
2004	0	1	0	1	\$0
2005	0	2	0	1	\$250,000
2006	0	2	1	0	\$350,000
2007	0	2	0	1	\$175,000
2008	0	0	0	0	\$0
2009	0	0	0	0	\$0
2010	0.01	2	1	4	\$0
2011	0	1	0	2	\$540,000
2012	0	0	0	0	\$0
2013	0	0	0	0	\$0
2014	0	3	0	1	\$876,040
Total	0.01	11	2	9	\$2,191,040

*Source: PHMSA Reports

Note: The criteria for significant gas incidents that must be reported to PHMSA are established in 49 CFR Part 191 and include incidents that result in fatalities, in-patient hospitalization, or

\$50,000 or more in total costs, measured in 1984 dollars. Significant Incident summary statistics for the U.S are also provided on the PHMSA website.

Reportable Gas Incidents by Cause

Year	Corrosion	Natural Forces	Excavation Damage	Outside Force	Material, Weld or Joint Failure	Equipment Failure	Incorrect Operation	Other	Total
2004	0	0	0	0	0	0	0	1	1
2005	0	0	0	0	0	1	0	1	2
2006	0	0	0	0	0	0	0	2	2
2007	0	0	0	0	0	0	1	1	2
2008	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	1	0	0	1	2
2011	0	0	0	0	0	0	0	1	1
2012	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0
2014	0	0	1	0	0	0	1	1	3

*Source: PHMSA Reports

Geographic Area Threats

Areas subject to Seismic Damage – All facilities in the Peoples Gas distribution system are subject to the possibility of seismic damage; however no facility has been damaged to date by a seismic event.

Areas Subject to Landslide Damage - There are no facilities in the Peoples Gas distribution system that are subject to landslide damage.

Areas Subject to Frost Heave Damage - All facilities in the Peoples Gas distribution system are subject to the possibility of frost heave damage.

Areas Subject to Flood Damage – Areas adjacent to the Chicago River and the Calumet River may be subject to Flood Damage.

7.0 Identify Threats

Code Requirement: §192.1007 (b) Identify threats. The operator must consider the following categories of threats to each gas distribution pipeline: corrosion, natural forces, excavation damage,

other outside force damage, material, weld or joint failure, equipment failure, incorrect operation, and other concerns that could threaten the integrity of the pipeline.

§192.1011 An operator must maintain records demonstrating compliance with the requirements of this subpart;

The primary threats to a natural gas distribution system are as follows and are described in the instructions for the DOT Annual Report, PHMSA Form F7100-1.1.

- a) Corrosion
- b) Natural Forces
- c) Excavation Damage
- d) Other Outside Force Damage
- e) Material or Welds
- f) Equipment Failure
- g) Incorrect Operation
- h) Other

Further explanation of threats:

a) **Corrosion**

All metallic pipe and components are subject to the threat of external corrosion. The threat of internal corrosion will be identified only where the expectation of liquid water being present in the facility exists or when an internal pipe inspection has shown corrosion to be present on the inside surface of the facility. Peoples Gas does not transport corrosive gas in its distribution system. Atmospheric corrosion is a subset of external corrosion that will occur only on pipe and components that are not buried. For exposed pipe in areas where only a light surface oxide forms that does not affect the safe operation of the facility (§192.479), the threat of atmospheric corrosion will not be identified.

b) **Natural Forces**

The natural forces threat is primarily weather related. While Peoples Gas facilities experience a wide range of atmospheric temperatures, the range is within the design limits of the materials of construction. All facilities in areas of known or reasonably anticipated land subsidence, landslides, earthquakes, significant or severe lightning activity, sinkholes or washouts will be susceptible to a natural forces threat. In the portions of the system that contain cast iron pipe and experience frost depths below the cover on the facilities a natural forces threat will be further investigated. Facilities in areas prone to occasional or periodic flooding may also suffer the natural forces threat. Piping that is unsupported, such as a span across a drainage ditch, will initially be considered as subject to a natural forces threat. Peoples Gas does not have any piping on pipe suspension bridges which would also be susceptible to natural forces such as wind effects or excessive weight due to ice accumulation.

c) **Excavation Damage**

All buried facilities in Peoples Gas distribution systems face the threat of being damaged by excavation activities. Consideration is also given to piping within protective casings, inside underground structures such as basins or vaults, under fenced Company-owned property, which may be shielded or protected from excavation damage.

d) **Other Outside Force Damage**

The primary concern is areas where gas piping is close enough to vehicular traffic such as automobiles, trucks, forklifts, construction equipment, etc., where it may be reasonably expected that damage from vehicle movement could occur. Facilities in locations known to be subject to vandalism, destruction, wreckage, sabotage, or other harm (e.g., unauthorized adjustment or valve movement) may carry the other outside force damage threat.

e) **Material, Weld or Joint Failure** (including mechanical coupling)

This threat is identified by Peoples Gas when it is known or anticipated that potential defects in pipe, fittings, components and joints that were introduced during the manufacturing process may be present. Longitudinal pipe seams made by low frequency ERW before 1970, electric flash welding, lap welding, hammer welding, or butt welding and fittings or components fabricated by welding may pose a weld-related material threat. Defects within fittings and components from the manufacturing process are material threats. Certain plastic piping materials (e.g., Century Utility Products pipe, Low-ductile inner wall Aldyl A pipe manufactured before 1973, PE3306 pipe, PVC pipe and fittings, CAB pipe material) are subject to this threat. Where it can be determined that pullout from a compression coupling can be anticipated (e.g., a non-pullout-resistant coupling installed at a location in the distribution system where thrust force can be expected), the joint failure threat will be determined to apply.

f) **Equipment Failure**

Peoples Gas will consider items of equipment exhibiting possible systemic problems as vulnerable to the equipment malfunction threat. Such items may include regulator or relief valves (e.g., failing to perform the intended task or operating outside of the manufacturer's specified tolerances), repeated history of failed flange gaskets, repeated history of failed O-rings, repeated history of broken pipe or stripped threads, equipment with a history of problems (e.g., a particular style or model, mechanical couplings).

g) **Incorrect Operation**

The threat of inappropriate operation may be applicable to either operating (e.g., start up or shut down of a pipeline, purging) or maintenance activities (e.g., ignition of escaping gas). This threat is totally associated with personnel. It does not include the designed operation of a device. Poor workmanship or outdated methods during the construction or installation process (e.g., acetylene girth welds, wrinkle bends, cast iron joining or inadequate support) are considered within this threat category. Knowledge of instances where personnel have not followed approved procedures (e.g., modification of a compression coupling contrary to the manufacturer's recommendation, failure to install a stiffener) could lead to identification of an incorrect operation threat. Human error is possible in performing every activity associated with a distribution pipeline system and is therefore an element of risk. In assigning weighting to potential human error, Peoples Gas considers such measures as:

- Not following procedures
 - Following procedures but erring in execution
 - Inadequate procedures (e.g., confusing, contradictory, or incomplete)
 - Awareness of changes such as tools, equipment, methods, safety precautions
 - How often the task is performed (e.g., on a regular basis versus only rarely)
 - Whether the individual is newly assigned to the task or highly experienced
 - Conversely, the intervention of knowledgeable and skilled personnel in an impending or actual pipeline failure can reduce the consequence segment of the risk equation.
- Measures to be evaluated include:

- Knowledge of potentially hazardous conditions
- Ability to react swiftly and accurately
- Willingness to call for help when needed
- Through the diligence of a rigorous training and qualification program exceeding the requirements of subpart N of Part 192, control of drug and alcohol abuse in accordance with Part 199, superior supervision and oversight of personnel performance, Peoples Gas provides the environment to ensure its personnel can prevent or mitigate the likelihood and consequence of an error as a contributor to risk.

h) **Other**

Peoples Gas will determine if other threats are present around its distribution system that are not covered in the threats described above. Such threats will likely be attributable to special circumstances in specific locations on the system. Accelerated material deterioration not resulting from a material defect or corrosion could come under this threat category. Threat data from other utilities, trade associations, and organizations may be considered if applicable to the distribution system.

Peoples Gas will consider reasonably available information to identify existing and potential threats to the distribution system. Certain primary threats are subdivided to gain a better understanding of the threat.

7.1 Initial Threat Identification

Threats to the distribution system were identified from various sources such as:

- Leak history data from the legacy leak database LKMS for 2005-2009 data. For 2010 and later, leak information will come from leak reports using data from the Asset Manager database.
- Corrosion control records from WAM database
- Incident history reportable to PHMSA
- Leak survey records from WAM database
- Maintenance history from AMRP analysis & Main Ranking Index
- Excavation damage data from PGL Facilities Damage database
- SME knowledge of the system from Managers and General Supervisors
- SHRIMP program
- Company bulletins for Distribution and Field Service Departments
- Broken main report
- Patrolling records from Bridge & Tunnel Inspections
- Bridge and Tunnel leak surveys
- Inside Safety Inspections
- Human Resources records for drug and alcohol testing
- NGA/SGA DIMP user guide

See the written plan from the SHRIMP program for additional documentation of threat identification.

7.2 Ongoing Threat Identification

Threats to the distribution system (either actual or potential) are identified on an ongoing basis by a variety of methods. Field personnel may notify their supervisor of a new threat such as equipment or material failures. Information from professional or trade associations such as Greater Chicago Damage Prevention Council (GCDPC), Gas Technology Institute (GTI), Gas Piping Technology Committee (GPTC), American Gas Association (AGA), Midwestern Energy Association (MEA) and American Public Gas Association (APGA) or publications, federal, state or local government agencies such as Pipeline and Hazardous Materials Safety Administration (PHMSA), Illinois Commerce Commission (ICC) and Chicago Police and Fire Departments, Integrys or other utilities may also assist in identifying threats.

Newly identified threats are handled on a case-by-case basis and are communicated throughout the organization using bulletins developed by the Technical Training and Standards group. These bulletins can be found on PowerNet in the Technical Training and Standards: Business Data tab in the Gas Engineering section. The action taken to reduce or eliminate the threat will vary based on the scope and cause of the threat.

Newly identified threats will be documented, evaluated and risk ranked in the DIMP plan during the periodic review process.

7.3 New Threat Identification Survey

The “New Threat Identification” survey has been developed to help capture and track new threats to the distribution system as they are identified. The responses will be handled on a case-by-case basis and reviewed quarterly with SMEs. Newly identified threats will be documented, evaluated and risk ranked in the DIMP Plan during the periodic review cycle. The survey can be accessed at the following link:

https://teams.integrystgroup.com/Depts/GO_PGLNSG/comp/SitePages/DIMP.aspx

8.0 Evaluate and Rank Risk

Code Requirement: §192.1007 (c) *Evaluate and rank risk. An operator must evaluate the risks associated with its distribution pipeline. In this evaluation, the operator must determine the relative importance of each threat and estimate and rank the risks posed to its pipeline. This evaluation must consider each applicable current and potential threat, the likelihood of failure associated with each threat, and the potential consequences of such a failure.*

General

Risks (actual and potential) are evaluated by grouping facilities with common traits and problems. The risk ranking result, if any, can then be applied to the group of facilities as appropriate. Facility grouping may be modified at any time when additional information becomes available. Common trait examples might include one or more of the following:

- Pipe material

- Operating pressure
- Pipe size
- Pipe specifications
- Pipe type (main or service line)
- Cathodic protection history
- Specific brand and model of fitting
- Age
- Geographical and/or geological area
- Operation and maintenance history
- Known installation practices
- Amount of construction activity
- Typical excavation method (e.g., blasting, plowing, open trench, trenchless)
- Other significant factors such as non-leak failures (overpressure)

8.1 Risk Evaluation and Ranking

Peoples Gas currently uses the output ranking from the SHRIMP program with SME validation as the method for the risk ranking of threats.

One approach used for risk ranking is to calculate a relative risk number rating by determining frequency and consequence factors associated with each facility or group of facilities based on available records, known operating history and input from company SME's. The ranking considers two factors: frequency and consequence. Frequency refers to the number of problems the operator has experienced with the facility or group of facilities being ranked and is used here as an indication of the likelihood of problems occurring in the future. Consequence refers to the extent of potential damage if the problem is not mitigated. For frequency factor ratings the SME will need to assign a value to each factor based upon leak, performance history, and knowledge of company personnel responsible for operation and maintenance activities. Alternately, the frequency factor could also be the number of leaks eliminated or repaired for a given threat.

The following frequency and consequence factor tables were developed by Integrys corporate personnel as one possible way to quantify system risks and, if used, may be modified as necessary to meet the needs of each individual subsidiary. The frequency factor table was not used at Peoples Gas. Selected values were used from the consequence factor table and are detailed in the Microsoft Excel Spreadsheets section below.

Example Frequency Factor Table (Company Specific)

Threat	Likelihood Factor
6" and smaller group	
Corrosion (graphitization)	2
Excavation damage	8
Natural Forces (frost heave)	7
Material or Weld Failure (joint type)	*B&S=6, *Mech=4
Inappropriate Operation (support during construction/backfill)	3
Larger than 6" group	
Corrosion (graphitization)	1